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ABSTRACT

A study examined the factors related to learning occurring in an adult education program. A purposeful sample of Ohio counties and 151 participants in a specific 1993-1993 adult education program who self-selected to participate in the study was used. A descriptive ex post facto study design was used. Pretests-posttests were administered to measure the impact of instruction on achievement at the processing, creating, and remembering levels of cognition, and instructors were interviewed to measure the level of cognition at which they planned to deliver the program. The most frequently intended level of instruction was at the remembering level, followed by the evaluating level. A negative, lower relationship was found between participants' learning and the intended level of instruction. A comparison of the students' pre- and posttest performance indicated that student learning in the program occurred primarily at the remembering level, which involves the ability to memorize and recall simple concrete facts and definitions. Little appeared to be learned at the creating and evaluating levels. It was recommended that country administrators take appropriate action to develop instructional objects that could elevate the program participants' level of learning (cognition). (Contains 2 tables, 3 figures and 11 references.) (MN)

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Factors Related to Learning Occurring In An Adult Education Program

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ABSTRACT

The study determined the learning of the participants in an adult educational program by assessing the prior knowledge, and the achieved cognition level of the participants in the training program. A purposeful sample of Ohio counties and participants in a specific 1992/93 adult education program who self-selected to participate in the study was used.

A descriptive ex post facto design was used. The study utilized two, parallel-form instruments, and an interview schedule. Validity of the instruments was established by a panel of experts. The instruments were pilot tested and their reliability coefficients were calculated. Relationships between the dependent (learning) and independent variables were described. The strength of relationships ranged from low to very strong associations.

The purpose of the study was to determine the learning of participants in an adult educational training program by assessing the prior knowledge, and the intended and achieved cognition levels of the participants in the training program. The research objectives used to guide the study were:

1. Determine the intended levels of cognition for the instruction in the program.
2. Determine the prior knowledge of the participants in the topics taught in the program.
3. Determine the levels of cognition achieved by the participants in the topics taught in the training program.
4. Determine the learning of the participants.
5. Determine the relationship between the learning of the participants and other variables.

Theoretical Framework

One of the principal concerns of those involved in adult education programs is the extent to which learning is occurring. Most development efforts in adult education have been directed toward the preparation of teaching materials. While high quality teaching materials are essential to quality instruction, they cannot solely address the concerns about learning that are occurring in adult educational programs (Miller, 1992).

Thomas and Anderson (1991) and Henderson (1988) observed the paucity of research on cognition levels in adult educational programs and suggested that the design of adult educational programs should include consideration of the levels of cognition in order to provide an adequate

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knowledge base in years ahead. Henderson suggested that adult educators should teach their clients how to further develop, use, and improve their cognitive skills in order to become better thinkers, problem solvers, and decision makers (1988).

Thomas and Englund, 1990; Evans, 1987 emphasized the powerful effect that prior knowledge has upon current learning and cognition. Rogers (1988) noted that "in many cases the people we train know enough already and possess enough skills". He went on to say "what prevents them from pursuing the desired activity is lack of confidence". Syinicki (1993) revealed that a goal of learning is to incorporate new information into prior knowledge. Participants in educational programs use prior knowledge to assimilate new information. He further indicated that presenting new information in its relation to prior knowledge not only helps participants learn the new information but strengthens the old. Therefore, evidence needs to be gathered about the the learning which is occurring in adult educational programs with respect to the prior knowledge, the achieved level of cognition, attitude, and selected demographic variables.

Methodology

A purposeful sample of Ohio counties and participants in a specific 1992/93 adult education program who self-selected to participate in the study was used.

A descriptive ex post facto design was employed. The pretest and posttest questions used to measure the impact of the instruction on achievement at the remembering level of cognition of participants were adapted from Hall and Prochaska (1991), the EPA Home Study Course (1980), and modified to suit this study. The pre- and posttest questions used in this study for measuring the impact of the instruction on achievement at the processing, creating and remembering levels of cognition were developed by the researcher based on the pesticide materials in use in the Ohio Pesticide Application Training (PAT) program, Bohmont (1990) and information in the core instruction material package. The form used for these tests was an objective multiple choice exam. Two instruments (parallel form) containing different questions, but all measuring the same domains, were used for the study. The study used the Newcomb-Trefz model of cognition (1987). The interview schedule developed by Bhardwaj (1989) was used to collect data that measured the intended level of cognition at which the PAT instructors planned to

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deliver the program. Validity for the instruments was established by a panel of experts. The questionnaires were pilot tested with 21 persons who did not participate in the final study. Coefficient alpha internal consistency reliability estimates were calculated for all levels of cognition and reliability ranged from .65 to .85. Inter-rater reliability of .89 was calculated for the interview schedule The learning of the participants was determined by finding the difference between their prior knowledge (pretest scores) and achieved level of cognition (post test scores). Relationships between the learning of the participants and other variables were described.

Results, conclusion, or point of view

Objective 1. Determine the intended levels of cognition for the instruction in the program.

Table 1 showed that the most frequently intended level of instruction was at the remembering level of cognition, followed by the evaluating level.

Objective 2. Determine the prior knowledge of participants in the topics taught in the program.

Twenty questions were used to collect data regarding the prior knowledge of the participants in the core area. Thus, five questions existed for each cognition level. Each question carried 1 point. Five points could have been scored by a participant that answered correctly all the questions in each cognition level and 20 points could have been scored by a participant that answered correctly all the questions in the four cognition level. A maximum of 755 points could have been scored by the 151 participants on each cognition level of the prior knowledge (pretest) exam. Figure 1 showed that the highest score, 555 points (74%), on the pretest was at the processing level. The next highest was on the evaluating level, 545 (72%), and followed by the remembering level with 501 (66%).

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Objective 3. Determine the levels of cognition achieved by participants in the topics taught in training program.

Twenty questions were used to assess the actual level of cognition achieved by the participants in the PAT program. Thus, five questions existed for each cognition level. Each question carried 1 point. Five points could have been scored by a participant that answered correctly all the questions in each cognition level and 20 points could have been scored by a participant that answered correctly all the questions in the four cognition level. A maximum of 755 points could have been scored by the 151 participants on each cognition level of the posttest exam. Figure 2 showed that of 755 possible points to be scored by participants in each cognition level in the posttest exam, the highest score, 587 (78%), was on the remembering level of cognition. The next highest was the processing level score of 561 (74%). Thus, participants' scores decreased as the level of cognition increased.

Objective 4. Determine the learning of participants in the training program.

Learning (achievement) of participants was measured as the sum of the mean of the raw score of the participants in the actual levels of cognition (posttest) exam minus the sum of the mean of the raw score of participants in the prior knowledge (pretest) exam. Achievement of participants was used as the dependent variable for this study. Figure 3 indicated that participants achieved most at the lowest level of cognition (remembering level) followed by the creating level of cognition. Prior knowledge of participants was higher than their achieved level of cognition in the PAT program at the evaluating level. Overall, the mean gain (raw score) achieved by the participants in the PAT program was .19.

Objective 5. Determine the relationship between the learning of the participants and other variables.

A negative, low relationship was found between the learning of the participants and the intended cognition level of instruction (r-.10). A negative, very strong relationship was found between the learning of the participants and their prior knowledge (pretest) of pesticide application (r= -.71). A positive very strong relationship (r=.74) was found between

the learning of the participants and their achieved level of cognition in the PAT program

Based on the assessment of the prior knowledge (pretest) and achieved levels of cognition, it was concluded that participants learned in this program primarily at the remembering level that involved the ability to memorize and recall simple, concrete facts and definitions. Little was learned at the creating and evaluating levels that required independent thinking and self-expression, and the ability to make a judgement or critical evaluation for a given set of information. County administrators should take appropriate action to develop instructional objectives which could elevate the level of learning (cognition) of the participants in this particular program.

Educational Importance of the Study

This study may raise the consciousness of educators and developers of curriculum materials so they may offer more cognitively balanced training materials. The findings may be important to advisory groups in reviewing proposed educational programs for content and instructional quality and proposing modifications in programs. Administrators may utilize the findings to ensure that teacher training programs deliver their charge to educate rather than simply transfer basic facts. Future participants may benefit from the findings by knowing the possible levels of learning required by the program in which they are participating. This awareness of learning level may rouse their enthusiasm and provide a needed challenge to develop higher levels of personal cognitive abilities. If this study is replicated in other states, the findings could facilitate state reciprocity in accepting each other's training programs or certificates.

Table 1

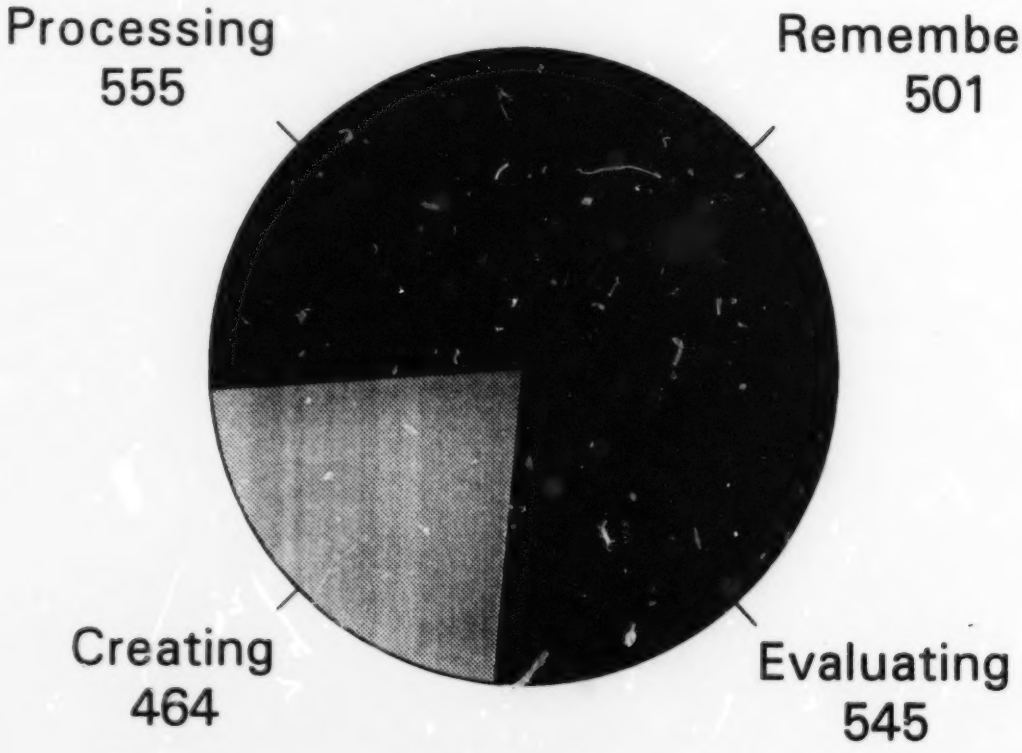
Intended Levels of Instruction at which the Instructors Planned to Deliver the PAT Program (n = 7).

Cognition Level	Frequency	Percent
Remembering (R)	7	25
Processing (P)	4	14
Creating (C)	3	11
Evaluating (E)	6	21
R + P	3	11
R + P + C	2	7
R + P + C + E.	3	11
Total	28	100

Figure 1

PRIOR KNOWLEDGE ACROSS COGNITION LEVELS

OHIO CORE PAT PROGRAM (n = 151) (Max. Score = 755)

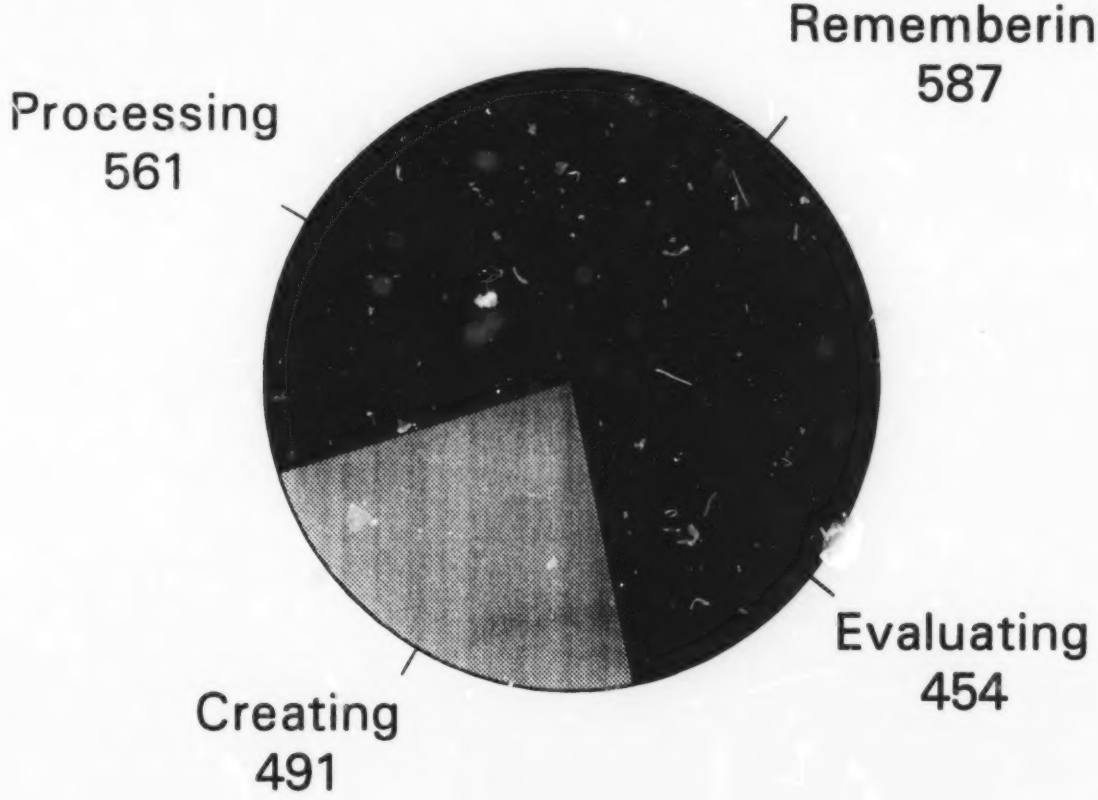


Average % : R = 66 P = 74 C = 61 E = 72
Mean R = 3.12 P = 3.68 C = 3.07 E = 3.61
SD R = 1.28 P = 1.36 C = 1.01 E = 1.24

Figure 2

ACTUAL LEVELS OF COGNITION ACHIEVED

OHIO CORE PAT PROGRAM (n = 151) (Max. Score = 755)

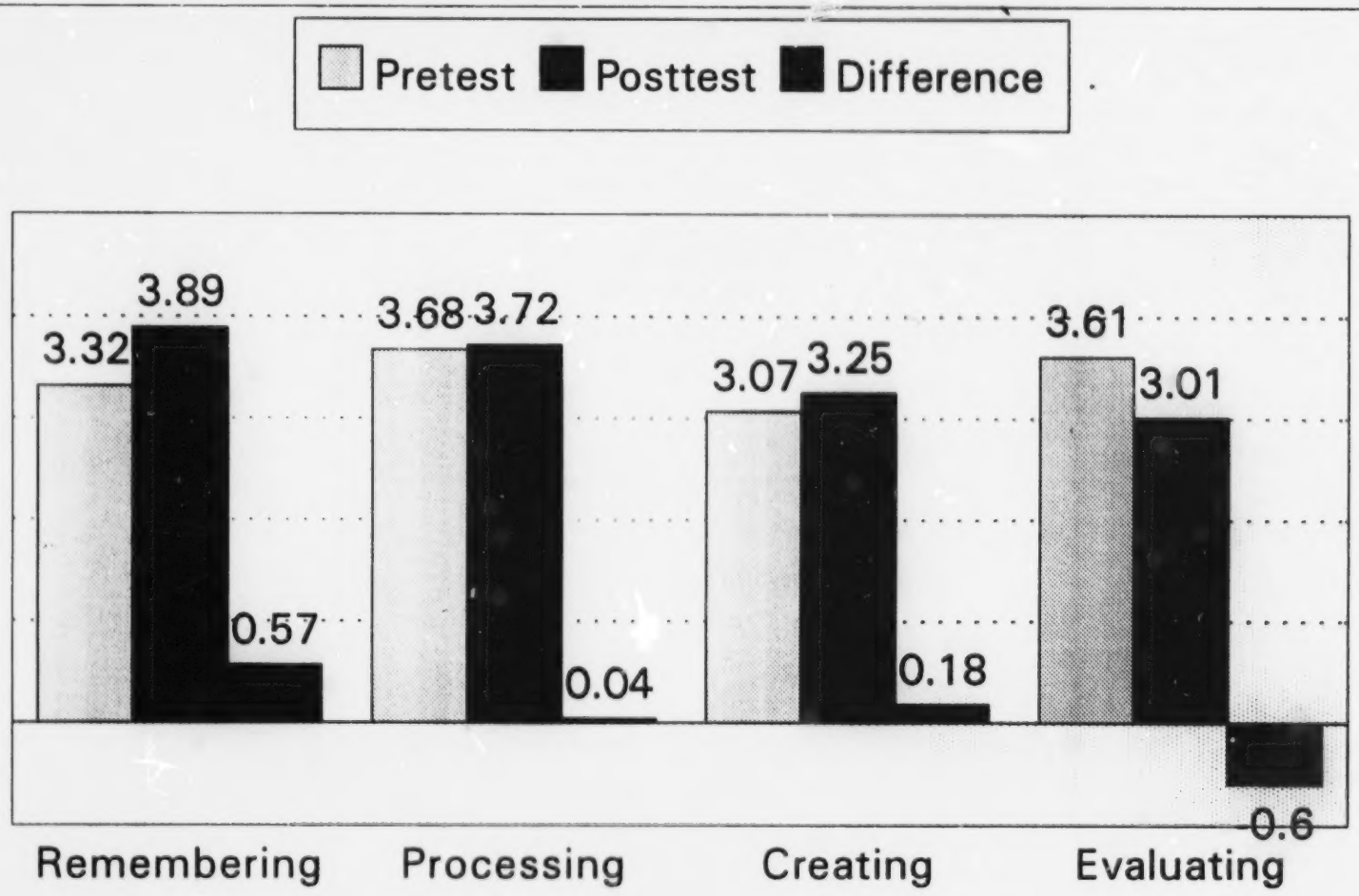


Average % : R = 78 P = 74 C = 65 E = 60
Mean R = 3.89 P = 3.72 C = 3.25 E = 3.01
SD R = 1.14 P = 1.20 C = 1.16 E = 1.28

Figure 3

MEAN ACHIEVEMENT SCORES: PRETEST & POSTTTEST

OHIO CORE PROGRAM PARTICIPANTS (n = 151)



Pretest Total = 13.68
Posttest Total = 13.87
Diff. Total = .19

Table 2

Relationship Among the Achievement of Participants and the Independent Variables (N = 151).

Independent Variable	Achievement
Intended cognition level of instruction	-.10
Prior knowledge of the participants	-.71
Actual level of cognition reached by the participants	.74

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